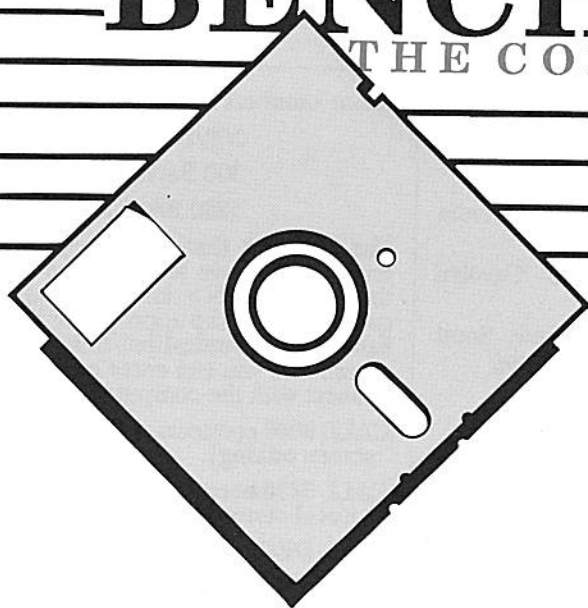


BENCHMARKS

THE COMPUTING CENTER



NORTH TEXAS STATE UNIVERSITY
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SERVICES AVAILABLE TO USERS OF THE NTSU COMPUTING FACILITIES

The NTSU Computing Center is located in the Information Sciences Building (ISB), Room 119. **Phone Numbers:** Computing Center: (817) 565-2324; Help Desk: 565-4050; Graphics Lab: 565-3479

BENCHMARKS Questions/Contributions, Etc - Claudia Lynch

Information & ID-Codes; Disk Space Problems - Carolyn Goodman

Statistical/Research Support - George Morrow, Scott Barber, Claudia Lynch, Rocky Ward, Panu Sittiwong

Academic ADABAS/COM-LETE - T.B.A.

CRSP & COMPUSTAT Problems - Panu Sittiwong

Student Programming Problems - CSCI Dept., GAB Room 542A; BCIS Dept., BA Room 152

JCL Problems; Password & Operating System Problems; Communication/Terminal Problems - Help Desk

Data Entry; Test Scoring & Analysis - Betty Grise

Administrative Applications - Coy Hoggard

Printout Retrieval - RJE Operators

DIALING UP NTSU COMPUTERS OVER THE TELEPHONE

Phone numbers for the Local Area Network (LAN) are:

300/1200 BAUD: (817) 565-3300; 3499

300 BAUD: D/FW METRO 429-6006

1200 BAUD: D/FW METRO 429-9314

The numbers that will accept either 300 or 1200 baud communications have an autobaud feature that requires you to hit the <RETURN> key repeatedly so that the receiving modem can determine the appropriate baud rate. When you have established a communications link, the # prompt will appear on your screen and you can enter one of following CALL commands to connect with the computer of your choice.

CALL 8040 connects with the NAS/8083 (does not support full-screen editing).

CALL 3270 connects with the NAS/8083 through a 3270 protocol converter (supports full-screen editing).

CALL DEC connects with the VAXcluster

CALL 780 connects with the Research VAX

CALL 2000 connects with the HP-2000

NTSU CABLE SYSTEM SCHEDULE

The current configuration of the NTSU cable system is as follows:

Channel 7 - NT Daily. Broadcasts from the NTSU Journalism Department.

Channel 8 - TAGER. Broadcasts go to and from NTSU to other links in this microwave network.

Channel 10 - NTSU Computer System Status Monitor (SSM). Displays the current status of the NAS, VAX, and HP computer systems supported by the Computing Center.

Channel 12 - Sammons Cable. Carries Cable News Network (CNN) unless a special program is requested.

Special broadcasts to and from classrooms can be arranged by the Media Library (565-2484).

HOURS FOR NTSU COMPUTER ACCESS AREAS: FALL 1987*

Location	Times	Days
Computing Center RJE	Noon-Midnight 7 a.m.-Midnight 7 a.m., Tuesday-Midnight, Saturday (Open 24 hours/day)	Sunday Monday Tuesday-Saturday
ISB 110 Terminal Area	2-10 p.m. 7:30 a.m. - Midnight 7:30 a.m.-6 p.m. 9 a.m.-6 p.m.	Sunday Monday-Thursday Friday Saturday
College of Business	Noon-11:45 p.m. 8:15 a.m.-11:45 p.m. 8:15 a.m.-7:45 p.m.	Saturday, Sunday Monday-Thursday Friday
GAB 550C	2 p.m.-Midnight 8 a.m.-Midnight 8 a.m.-5 p.m. 2-8 p.m.	Sunday Monday-Thursday Friday Saturday
Graphics Lab	1-11 p.m. 8 a.m.-11 p.m. 8 a.m.-7 p.m. Noon-5 p.m.	Sunday Monday-Thursday Friday Saturday

*Hours may vary. Check MUSIC/VAX News and/or posted schedules for exceptions.

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GENERAL INFORMATION

BENCHMARKS Standards

By Claudia Lynch, *Benchmarks* Editor (AS04@NTSMUSIC)

In keeping with our "new look," the folks in Academic Computing Services who bring you *Benchmarks* are attempting to set certain standards with regard to the appearance of the newsletter. For example, if a command to be entered from a keyboard is referred to in a sentence, it will appear in bold face. However, if a screen is to be simulated, the text will be smaller and offset and the commands to be entered will appear in a shaded background. Keys on a keyboard will normally be represented <CAPITALIZED BETWEEN LEFT AND RIGHT ARROWS>. If instructions are being quoted from another source, however, the keys will be represented as they were in the original. We hope these standards will help our readers to better understand the instructional segments of our articles. We will keep you informed of any changes and/or additions to the above mentioned standards. §

UserIDs Disabled

All faculty and individual UserIDs that were not renewed have now been disabled on the academic computing systems. If you did not renew your UserID and you still wish to use the NTSU mainframe computing facilities, you must submit a pink ID Renewal Request form to the Computing Center. Research grant UserIDs should be renewed, even if a new grant account number has not yet been established. If you have any questions regarding this or other UserID matters please contact the Computing Center (565-2324). §

Node News is Good News

So, you think our system is down for strange reasons... The following message was received at NTSU from the BITNET Network Information Center. It cannot be verified as to its authenticity, however it does provide a different perspective on the nature of system downtime.

IPFRCVM - Iowa Pig Farm Research Center will be down tomorrow from 20:00-23:00 for system maintenance. Since we are an end node, nobody will be affected except for us. It turns out that one of our sows got in through a hole in the wall and had her litter of piglets under our raised floor. The operator on duty got quite a scare when he heard a number of squeals. He assumed we had some massive head crashes and powered down the CPU. Since the squeals continued we traced it to a corner under our raised floors. We will be off the air tonight so that we can power down again and get the sow and her piglets out from under the floor. Zeke - System Grunt IPFRC §

Computing Center Short Courses

The Computing Center is offering the following short courses during the month of October. Please pre-register to attend. A maximum of 15 people will be admitted to each of the Introduction to MUSIC/SP classes, parts I & II. A maximum of 20 people will be admitted to each of the remaining classes.

1. **Introduction to MUSIC/SP, Part I** - MUSIC/SP is the primary interactive operating system employed by most academic users to access the NAS/8083 IBM-compatible mainframe computer at NTSU. MUSIC users have access to a variety of programming languages, a sophisticated word processing system, and several statistical analysis packages. MUSIC also gives you the capability to submit batch jobs to the MVS operating system. Topics covered include gaining access over the Local Area Network, logging on and off, changing your password, and creating, editing, and storing files using the full-screen editor.

Three separate two-hour sessions to be held in Room 110 of the Science Library (ISB):

Monday, October 19: 9-11 a.m.

Instructor: Scott Barber

Tuesday, October 20: 3-5 p.m.

Instructor: Rocky Ward

Wednesday, October 21: 1-3 p.m.

Instructor: Panu Sittiwong

2. **Introduction to MUSIC/SP, Part II** - This course provides an in-depth look at various useful programs and utilities that are available on MUSIC/SP. Topics covered include accessing on-line help facilities, using electronic mail, routing output to high-speed printers, and writing files to secondary storage such as disk and tape. A working knowledge of MUSIC is required.

A two-hour session to be held in Room 110 of the Science Library (ISB):

Tuesday, October 27: 6-8 p.m.

Instructor: Philip Baczewski

3. **Introduction to IBM Job Control Language (JCL)** - This course provides an overview of IBM JCL for users who wish to further their knowledge in this area. It is useful to individuals who plan to run batch jobs (e.g. SAS, SPSS^X, BMDP) on the IBM-compatible mainframe computer.

A two-hour session to be held in the Graphics Lab (ISB):

Wednesday, October 21: 1-3 p.m.

Instructor: George Morrow

4. **Introduction to SAS** – SAS is one of the most widely implemented data analysis systems within business and education. SAS is particularly well suited for dataset manipulation and includes an extensive procedure library providing a wide range of analytical tools. This course is recommended for individuals who plan to incorporate statistical analyses into their research. Topics covered include the reading of data into SAS, simple data transformations, recoding variables, labeling output, and performing simple univariate and bivariate analyses. **Prior knowledge of MUSIC/SP is required.**

A two-hour session to be held in Room 110 of the Science Library (ISB):

Thursday, October 22 : 6-8 p.m.

Instructor: Panu Sittiwong

5. **Introduction to SPSS^X** – SPSS^X is the latest version of this popular data analysis system originally developed for social scientific research. While SAS is slightly more powerful for the analysis of complex datasets, many users find SPSS^X to be easier to learn. SPSS^X also includes more flexible facilities for collapsing and labeling variables. This course is recommended for individuals who plan to incorporate statistical analyses into their research. Topics covered include the reading of data into SPSS^X, simple data transformations, recoding variables, labeling output, and performing simple univariate and bivariate analyses. **Prior knowledge of MUSIC/SP is required.**

A two-hour session to be held in Room 110 of the Science Library (ISB):

Monday, October 26: 6-8 p.m.

Instructor: Rocky Ward

6. **File Handling with SAS, SPSS^X, and BMDP** – Anyone who uses these common statistical packages frequently should be aware of procedures available to simplify reading and processing datasets. Variable formats, labels, and computed variable information can be stored in a dataset and recalled in a future job with one command. This course shows you how to use simple JCL along with the statistical software to make your jobs run much more quickly and smoothly. Familiarity with at least one of the packages mentioned is necessary.

A two-hour session to be held in the Graphics Lab (ISB):

Friday, October, 30: 1-3 p.m.

Instructor: Scott Barber

7. **Introduction to SAS/GRAPH** – This course introduces those people who are familiar with CMS and have a valid CMS ID-code (see #8 below) to the use of the interactive graphics capabilities of SAS. **A working knowledge of SAS is helpful in getting the full benefits from this class.**

A two-hour session to be held in the Graphics Lab (ISB):

Tuesday, October 27: 3-5 p.m.

Instructor: Panu Sittiwong

8. **Introduction to CMS** – This course provides an introduction to the CMS interactive operating system available on the IBM compatible computer. **Only those faculty members and graduate students who have received prior approval from the Academic Computing Services Manager to have a CMS ID-code are eligible to take this course.**

A two-hour session on using CMS to be held in the Graphics Lab (ISB):

Monday, October 26: 3-5 p.m.

Instructor: Philip Baczewski

9. **Introduction to VAX/VMS, Part I** – VMS is the interactive operating system used on the Digital Equipment Corporation (DEC) VAXcluster. Nearly all popular programming languages are supported under VMS. The topics covered in this course include gaining access to the VAXcluster through the Local Area Network, logging in and out, changing your password, creating files and directories, creating login command files, using the EDT editor, and defining logicals and symbols.

A three-hour session to be held in Room 110 of the Science Library (ISB).

Thursday, October 22: 2-5 p.m.

Instructor: Ron Brashear

10. **Introduction to VAX/VMS, Part II** – This course provides a more detailed examination of VMS commands and utilities. The topics covered in this course include use of the electronic mail and messaging systems, creating command files, advanced editing using TPU, and sending mail through BITNET. **Prior experience using VAX/VMS is required.**

Two separate two-hour sessions to be held in Room 110 of the Science Library (ISB):

Wednesday, October 28: 1-3 p.m.

Instructor: Ron Brashear

11. **Introduction to BITNET** – BITNET is a network linking more than 600 computers at over 300 institutions and research centers. This course covers the basic concepts of BITNET, file transfers across BITNET sites, and other services that are available on this computer network. Faculty and graduate students needing to exchange information with other universities and research institutions in the U.S., Canada, Europe, or Japan will benefit greatly from attending this course. **Prior knowledge of at least one of the following interactive operating systems is required: CMS, MUSIC, VAX.**

A two-hour session to be held in Room 110 of the Science Library (ISB):

Wednesday, October 28: 3-5 p.m.

Instructor: Philip Baczewski §

What's NEWS ?

Philip Baczewski, MUSIC/SP Time-Share Coordinator
(AC12@NTSMUSIC)

MUSIC/SP users may have noticed a message that appears every time they log onto their MUSIC ID. Usually it says something like,

Enter /NEWS for the latest system information (REF: 09-04-87).

The /NEWS command on MUSIC allows you to read a listing of current news and other relevant information about MUSIC, about other computing systems at NTSU, and about BITNET. You can shorten this command to NEWS or even just N.

The news file contains such information as downtime notices for MUSIC and other computing systems, major BITNET downtime notices, MUSIC software upgrade information, announcements of NTSU Computing Center events and activities, and descriptions of Computing Center operating policies and procedures.

To be a fully informed MUSIC user, you should make a habit of reading the MUSIC NEWS file fairly regularly. In the message described above, the last portion tells the date of the most current message. When that date changes, you will know that the NEWS file has been updated and you can type NEWS to see the latest version. If you wish to read only the first few messages, you can interrupt the NEWS listing by entering MUSIC BREAK MODE, typing /CANCEL, and pressing <RETURN> (3270 users can enter BREAK MODE by pressing the key sequence, <ESC> <ESC> <P> <1> -- 8040 users can enter BREAK MODE by pressing their terminal's <BREAK> key -- PCWS users can press the keypad minus key <-> to send a BREAK signal -- microcomputer users using other communications software should consult their communications software documentation for the correct BREAK sequence).

The VAXcluster also offers users the ability to read a news listing. Typing NEWS from the VMS \$ prompt will allow you to read the VAX NEWS file. Just as MUSIC NEWS has items related to MUSIC software and its use, VAX NEWS will tell you when software has been updated or when new utility programs have been made available, when system downtime has been scheduled, and also give you general information about the different computing systems. When you first log onto the VAXcluster, along with the usual sign-on messages, you will see a list of VAX NEWS highlights. VAX users should also make a habit of reading NEWS to keep fully informed on computing at NTSU. If you wish to read only the first few VAX NEWS messages, you can press <CTRL> <C> or <CTRL> <Z> to interrupt the listing.

If you have any questions about NEWS, or the items that appear in the NEWS file, contact the HELP DESK at 565-4050 (ISB 110) or the Computing Center at 565-2324 (ISB 119).§

Spotlight on MUSIC 1.2, Part I - VSAM

By Philip Baczewski, MUSIC Time-share Coordinator
(AC12@NTSMUSIC)

This is the first in a series of articles highlighting some of the important new features of MUSIC/SP Release 1.2 which is scheduled for installation at NTSU in early January 1988. This series is intended to provide introductory information to assist NTSU faculty, students, and staff in planning for the change-over to this new version of MUSIC.

Introduction to VSAM

VSAM (Virtual Storage Access Method) is a data set organization method currently available on the OS/MVS operating system here at NTSU. With the installation of MUSIC 1.2, an implementation of OS/VS VSAM will be accessible on MUSIC. MUSIC/SP supports the three type of VSAM files:

- **ESDS (Entry Sequence Data Set)** - The record sequence of an ESDS is determined by the order in which the records are entered into the file, without reference to the record contents. New records are stored at the end of the file.
- **KSDS (Key Sequence Data Set)** - The record sequence is determined by a key containing a unique value, such as employee, invoice, or transaction number. The key is a contiguous portion of the record and is defined when the file is created. The record order is defined by the EBCDIC collating sequence of the key field contents.
- **RRDS (Relative Record Data Set)** - The file is a string of fixed-length slots, each identified by a relative record number (RRN). Each slot can either contain a record or be empty. Records are stored and retrieved by the relative record number of the slot.¹

The most significant aspect of VSAM is the ability to store and access records using a key (KSDS). Each key, along with a pointer to its corresponding data record is stored in a multi-level index, which can be quickly searched for a given key. Records can be added, changed, and deleted and VSAM automatically updates the index as required. It is also possible to access the records sequentially in order of increasing or decreasing key value.²

MUSIC's VSAM Implementation

A MUSIC VSAM data set occupies one Save Library File, consisting of a data component and an index component. A VSAM file to be used by a program must first be created and initialized using the AMS (Access Method Services) utility on MUSIC. The AMS utility allows you to specify file charac-

¹ Keller, J. Robin, SAS Guide to VSAM Processing, Version 5 Edition, SAS Institute Inc., Cary, NC, 1985, p. 9.

² MUSIC/SP 1.2 User's Reference Guide, IBM corp., Third Edition, (June, 1987).

teristics such as name, type of file, amount of disk space needed, data and index control interval lengths, length (1-255 bytes) and position of the key field, and maximum logical record length. Once a VSAM file has been created, it may be accessed using the implementations of PL/I, VS Cobol, VS Fortran, or VS Assembler found on MUSIC.

VSAM indexes on MUSIC have the same structure as on OS, and the index records have the same basic format but with a few differences. VSAM Control intervals on MUSIC have the same format as on OS, but spanned records are not allowed.

Differences Between OS and MUSIC VSAM

While most features of OS VSAM are supported by MUSIC, there are some limitations and some differences in its implementation. The major features not supported by MUSIC VSAM are control interval access, spanned records, and data set passwords. Also, MUSIC does not maintain a separate VSAM catalog. Attributes and control information for a VSAM file are stored in the first block of the data component and index component files. A complete list of restrictions that apply to MUSIC VSAM will be available in the *MUSIC/SP 1.2 User's Reference Guide*.

References

For those wanting to learn more about MUSIC VSAM and VSAM in general, the following references may provide some basic information.

OS/VS Virtual Storage Access Method (VSAM) Programmer's Guide, IBM corp., publication number GC26-3838.

Introduction to IBM Direct-Access Storage Devices and Organization Methods (student text), IBM corp., publication number GC20-1649. Refer to the chapter on VSAM.

OS/VS2 Access Method Services, IBM corp., publication number GC26-3841. (The MUSIC AMS utility is a subset of the OS Access Method Services.)

Doug Lowe, VSAM for the COBOL Programmer, Mike Murach & Associates, Fresno, CA, 1982.

SAS Guide to VSAM Processing, Version 5 Edition, SAS Institute, Cary, NC.

Next Time... Spotlight on MUSIC 1.2, Part II - New Commands

BENCHMARKS FORUM

BENCHMARKS Forum is intended to serve as a vehicle for answering questions that may be of general interest to the user community. If you have a question, please send electronic mail to the *Benchmarks* editor (AS04@NTSMUSIC) or write it down and drop it by the Computing Center. Deadlines permitting, we will try to answer it in the next issue.

Question: Recently, while I was doing some work on the VAXcluster, I came across a reference to "spawning a process." Can you explain to me what this means?

Answer: The DCL command *Spawn* puts your present process in a hibernating state (meaning nothing will hap-

pen to it) and then initiates a new subprocess and attaches it to your terminal. The real utility of this feature is that it allows you to easily exit a current session (an edit session, for example) and then resume at the point where you left off. The trick is to abort the currently running image (editor, program, or whatever) with a <CTL> <Y> and then type *Spawn* at the \$ prompt. The system then responds with a message indicating that a new subprocess is attached to your terminal, and then you can perform whatever function you need to perform (answer PHONE, read a Mail message, etc.). To return to the previous process, merely log off (the system responds with a message indicating you are attached to the original process), then type *Cont* (short for continue) and press <RETURN> at the \$ prompt, and you will reactivate the previous image (edit session, etc.). If you were editing, a <Ctl> <W> would have to be typed to refresh the screen. The subprocess preserves the logicals and symbols of the parent process, but new logicals and symbols established in the subprocess would not be added to those of the parent process. Thus, the parent process is not altered by the subprocess. As many as six subprocess can be established in this manner, each a child of the previous parent.

Question: I've been thinking about purchasing an IBM-compatible PC, but I'm confused about what kind of display adapter and monitor to purchase. Do you have any advice about this?

Answer: There are four major display options for IBM-compatible computers that you may wish to consider. The first, and least expensive, option is the monochrome display adapter (MDA). The original IBM monochrome display adapter was not capable of displaying any graphics, but the Hercules Graphics Adapter (HGA) added high-resolution graphics (720 by 348 pixels) to the original IBM MDA standard. This standard is widely supported by applications software and displays very crisp, well defined text characters. Thus, it is quite suitable for word processing work. It is also an excellent choice for graphics if you do not need color. If you choose to buy a monochrome adapter, insist that it support the HGA graphics. HGA interface cards usually cost between \$50 and \$75 and the monochrome monitors (usually green or amber) are available for less than \$100.

The second option is the Color Graphics Adapter (CGA), capable of displaying monochrome text and graphics at a resolution of 640 by 200 pixels or four-color graphics (chosen from a palette of 16 colors) at 320 by 200 pixels. The CGA adapter was IBM's first color option, but the lack of resolution results in poorly defined text characters and graphics with jagged edges. However, CGA graphics are supported by virtually all graphics applications software. CGA cards cost between \$50 and \$75, and a CGA-compatible monitor will cost \$250-\$350.

The most popular color graphics option is the Enhanced Graphics Adapter (EGA). EGA is capable of displaying monochrome or color graphics at a resolution of 640 by 350 pixels with up to 16 colors displayed simultaneously. Text resolution is far superior to CGA, but not quite as sharp as MDA/HGA. EGA is widely supported by newer applications software, but some older graphics applications software may not be compatible (EGA adapters will support older software

at CGA resolutions, however). EGA cards cost between \$125 and \$350 and EGA monitors cost between \$350 and \$600.

The newest color graphics standard is the Video Graphics Array (VGA) recently introduced on the IBM PS/2. VGA includes a variety of monochrome and color modes ranging from 320 by 200 pixels with 256 simultaneous colors to 640 by 480 pixels with 16 simultaneous colors. Text resolution is slightly better than that found on EGA adapters. VGA adapters require special analog monitors that cost over \$500. While VGA adapters are built into the PS/2 motherboard, IBM does offer a VGA adapter for older PCs. These boards cost around \$400.

The ideal solution for demanding users is the combination of a multi-scan monitor such as the NEC Multisync and a multi-mode graphics adapter capable of displaying all of the standards discussed above. These monitors cost around \$600 and the adapter boards, which are just beginning to appear, cost from \$300 to \$400. Note, however, that while some manufacturers advertise their boards as being VGA-compatible, they may not be capable of supporting all VGA modes.

Question: *Is there any way I can sort a MUSIC file?*

Answer: There are several sort facilities available on MUSIC. The SORT command allows you to sort a file based on a single control field. A more powerful sorting method is the MNSORT utility. MNSORT is a generalized sort program which can put records (lines) of a file into ascending or descending order according to various types of control fields.

Suppose, as an example, you had the following records in a file:

```
222 BBB
111 BBB
333 AAA
111 AAA
222 AAA
333 BBB
```

You could use MNSORT to sort the records according to both the numeric and alphabetic fields. The following example shows a typical use of MNSORT using the above records as an example. The file containing the records is called EXAMPLE, the first sort field starts in column 1, the second sort field starts in column 5, and both sort fields are 3 characters long. What you type is printed in a shaded background.

*GO

MNSORT

ENTER SORT PARAMETERS OR HELP

?

INPUT = 'EXAMPLE' FLDPOS = 1,5,FLDLEN = 3,3

SRT000 BEGIN SORT. RECORD LENGTH = 80, AREA =
51920 SRT000 RECORD COUNT = 10
SRT000 NORMAL END OF SORT
JOB TIME 1.61 SERVICE UNITS

EXAMPLE
REPLACED

*End
*Go

After this sort, the records in your file would appear as follows:

```
111 AAA
111 BBB
222 AAA
222 BBB
333 AAA
333 BBB
```

If you wanted to sort by the alphabetic field, you could use the same command as above, but specify FLDPOS = 5,1 and the result would be:

```
111 AAA
222 AAA
333 AAA
111 BBB
222 BBB
333 BBB
```

For more information about MNSORT, type **HELP MNSORT** from MUSIC *GO mode, or type **MNSORT** and then type **HELP**. For more information on other sort facilities available on MUSIC, type **HELP SORT** from *GO mode.

Question: *I use MUSIC to run SPSS^X jobs and I'm confused about the difference between MUSIC passwords and OS/MVS Batch passwords. Can you clarify this?*

Answer: All the UserIDs which are authorized to use the MUSIC/SP and OS/MVS operating systems will have two distinct passwords. You will be prompted to enter a password when you log onto the MUSIC/SP system. This is the MUSIC/SP sign-on password. Additionally, in order to submit SPSS^X and other batch programs that run on the MVS operating system, you will be required to type your batch password on your "job card" that is submitted from MUSIC to MVS. At NTSU, your job card will be the third line of your MUSIC/SP file that you submit to MVS. This line will be as follows:

```
//ldnnxxxx JOB (ldnn,time,lines), 'your name', PASSWORD=batchpw
```

where:

ldnn is your userid;

xxxx is an optional 4 character job name;

time is the estimated CPU time (in minutes);

lines is the number estimated output lines (in 1000s);

batchpw is your OS/MVS batch password.

There are some distinctive differences between MUSIC/SP and batch passwords. First, they are changed by different utility programs. Your MUSIC password can be changed using the NEWPW option of the MUSIC/SP PROFILE utility (type **PROFILE** at the MUSIC *GO prompt). Your batch can be changed by running the CHANGE PW utility (type **CHANGE PW** from the MUSIC *GO prompt). Second, after you change your MUSIC/SP password, it will be valid until you change it again (i.e. it will never expire as long as your ID is valid). The batch password, on the other hand, will be valid for up to 180 days after you change it.

When your UserID is first assigned by the Computing Center, both passwords are the same random series of alpha-numeric characters. You will need to change each password with the two procedures outlined above. Although it is possible to use the same word for each type of password, as a security precaution, we recommend that you use two different words: one for your MUSIC/SP sign-on password and another for your batch password. §

MICROCOMPUTERS

Cataloging Your Floppy Disk Collection - WSSINDEX

By Scott Barber, Academic Computing Consultant
(AC10@NTSMUSIC)

After having a PC for a while, I found that my initial small set of floppy disks had suddenly proliferated out of control. Software and data files were getting harder and harder to find among my heap of half-labeled diskettes. Fortunately, there are several programs available for organizing and cataloging disk libraries. This article discusses the use of one of them, WSSINDEX.

When first running WSSINDEX, you are given the choice of reading a brief, but adequate version of the documentation. WSSINDEX then provides a default configuration of several parameters which you may change. These parameters include the disk from which files will be indexed, the maximum number of files, disks, and sub-directories allowed, whether or not to extract information in .ARC files, and the report format.

After you save the configuration data, the main menu appears. From there, you can add or remove disks from the database; affix or change a diskette volume label; print sorted or unsorted reports; or find a file or group of files by any combination of file name, extension, disk name, sub-directory, size, date and time, category (e.g. word processing, utilities, SPSS-PC data files) and .ARC file name or extension.

WSSINDEX also provides the ability to add (and edit) comments to cataloged files, which can help to identify them later. This can be useful in some instances, but entering these comments is rather cumbersome, especially if you have a large number of files. Additionally, comments can greatly expand the space required on disk and in RAM for storage and searches.

A nice feature of WSSINDEX for some people is the ability to catalog files which are stored in .ARC files. (This is an increasingly common format for storage and distribution of software and data files.) If you were looking for the file PROGRAM.EXE, and you knew it could be in any of several .ARC files on any of 10 different utility diskettes, a WSSINDEX search would quickly tell you that it is on the UTILS 2 disk in UTILPAC3.ARC (which may have 30 DOS utilities inside). Otherwise, you could spend a lot of time searching your ARCD files one by one.

Before running WSSINDEX, it may be helpful to use the QF utility to reorganize your files [QF is similar to FFM (see *Benchmarks*, Nov/Dec. 1986) and can be obtained from the Computing Center]. While the WSSINDEX.EXE program

allows you to find files regardless of where they are, good organization of your files can quicken searches and ease diskette labeling. By the way, once you have applied a volume label (11 digits or less) to be read by DOS and WSSINDEX, also put it on the exterior label for quick reference.

As you make changes to a diskette by adding or deleting a file or files, put a (light) pencil mark in the corner of the exterior label. The next time you run WSSINDEX, use the A)dd command to read all marked diskettes again. Changes will be recorded in the database, and you can then easily erase the marks (be careful not to damage diskettes when marking on and erasing these labels).

I have found it useful to keep on hand a list of files sorted by extension, which enables me to find most files fairly quickly. For this and other reasons, it is a good idea to establish and stick to some conventions for file names and extensions. Some extensions are mandatory for MS-DOS, and others are arbitrary, but they are all useful for organization. A few examples of commonly seen extensions are .COM, .EXE, .BAT, .TXT, .DOC, .ARC, .BAS, .LET, .MSG, and .MEM.

WSSINDEX version 3.00 is designed to load the entire database into RAM rather than storing some of it on disk and reading it as needed (disk caching). So, as your database gets large, you will need to make sure you allow enough internal RAM for it. This can be a problem if you like to load up RAM with ramdisks or RAM-resident software. One solution is to set up another set of very basic AUTOEXEC.XXX and CONFIG.XXX files (which must include EMULATE on the TIPC). Also, set up a file called SWITCH.BAT containing the following lines:

```
RENAME AUTOEXEC.BAT AUTOEXEC.YYY
RENAME CONFIG.SYS CONFIG.YYY
RENAME AUTOEXEC.XXX AUTOEXEC.BAT
RENAME CONFIG.XXX CONFIG.SYS
RENAME AUTOEXEC.YYY AUTOEXEC.XXX
RENAME CONFIG.YYY CONFIG.XXX
```

By running this file and re-booting, you will have the system-configuration you need to run WSSINDEX. §

Using Kermit with Procomm

By Scott Barber, Academic Computing Consultant
(AC10@NTSMUSIC)

In the June/July issue of *Benchmarks*, we discussed using Kermit to transfer files between NTSU remote mainframe systems and a PC. In that article, we focused on the use of readily available versions of Kermit for many different types of PCs. This article discusses how to use the Kermit protocol within the Procomm communication package.

After loading the software, you must be sure to correctly set the communication parameters (line settings) by pressing

<ALT> <P> (press the <P> key while holding down the <ALT> key). If you will be using the NAS system (for MUSIC or CMS), then use 1 stopbit, 7 data bits, and even parity.

With the VAX, use 8 data bits, 1 stop bit, and no parity. (When using Procomm v.2.4.2 at 9600 baud on the NTSU Local Area Network (LAN), I use parameter setting "5" with the NAS system, and "11" with the VAX.) You can save these settings on disk to avoid resetting parameters each time you use Kermit.

After returning to the terminal mode (with the status line at the bottom of the screen), press <ALT> <S> to view the "Setup" menu. From there, select "2" to see the Terminal Setup sub-menu. As with the communications settings, there are differences in the configuration here depending upon the mainframe system you want to access.

If you are using the VAX, set the flow control parameter to XON/XOFF. For the NAS, disable flow control by selecting NONE. (This is in contrast with the flow control setting for standard MS-Kermit with the NAS, which is XON/XOFF.)

Another difference in settings is that duplex should be FULL for the VAX and HALF for the NAS system. Since the ECHO parameter on the LAN must be OFF, without setting half duplex for MUSIC or CMS you will not be able to see what you are typing. Alternatively, you can toggle the duplex setting from the terminal mode with <ALT> <E>.

Press <ESC> to return to the Setup menu, and then select the Kermit Setup sub-menu. There are two parameters here which may need to be changed. These are the handshaking character and the file type. For the VAX, the handshaking character should be "0", but for the NAS mainframe, it should be set to "17". As with flow control, this contrasts with the MS-Kermit handshaking value, which should be "none" for both VAX and NAS systems.

You should set the file type to binary or text, depending upon whether you are transferring non-printable (such as DOS files with extensions .COM, .EXE, .ARC, etc.) or printable files (those which can be TYPED from the DOS prompt). Note that because of the version of Kermit on MUSIC, you cannot transfer binary files to and from MUSIC, so the file type should always be set to text.

Packet size may be set for 94, even though 90 may work better when receiving files from MUSIC with MS-Kermit. Both the send-packet size and receive-packet size are set by the "maximum packet size" parameter in the Kermit Setup sub-menu. We have successfully tested sending and receiving packets of 94 bytes. The rest of the Kermit parameters should be correct as distributed.

To run Kermit on the mainframe, simply type Kermit from the system prompt on MUSIC, CMS, or the VAX (see the June/July, 1987 *Benchmarks*). To download a file to the PC, enter the following command on the mainframe:

```
SEND filename <RETURN>
```

Where *filename* is the name of the file to be downloaded.

After entering the SEND command, press the <PgDn> key. You will be prompted for the protocol you want to

use, and you should, of course, pick Kermit. The file transfer will begin, and you will see a screen keeping you posted on the transfer's progress.

To upload a file, enter the RECEIVE command on the mainframe, and then press the <PgUp> key to tell Procomm you want to upload a PC file. After selecting the Kermit protocol, you will be prompted for a file name. You may use standard DOS path names to specify a file from any disk or sub-directory in your system. As with downloading, you will be presented a screen showing how the transfer is progressing.

Remember that the LAN ECHO parameter should always be OFF, and that parity, flow control, and handshaking should all be correct in order for the transfer to work.

	LAN ECHO	Duplex	Parity	Hand- shaking	Flow control
MUSIC (8040)	OFF	HALF	EVEN	17	NONE
CMS	OFF	HALF	EVEN	17	NONE
VAX (VMS & Eunice)	OFF	FULL	NONE	0	XON/XOFF

Micro-Tips

This column is intended to serve as a forum for sharing useful tips on making more productive use of microcomputers. If you have a tip that you feel may be of use to campus users, submit it to the BENCHMARKS editor for possible inclusion in a future issue.

Using the DOS PATH Command

As you may already know, when you run a program on an MS-DOS microcomputer, you simply type the name of a file (excluding the extension) having an extension of .COM, .EXE, or .BAT. Under normal circumstances, DOS looks only in the current directory for the filename with one of these extensions. If DOS can't find such a file, you will see the familiar BAD COMMAND OR FILENAME message.

The MS-DOS PATH command allows you to run files that are not in the default sub-directory. It accomplishes this by instructing DOS to search specified directories, looking for .COM, .EXE, or .BAT file (in that order) with the name you entered that cannot be found in the current directory. For example, if the following PATH command has been entered (or included in your AUTOEXEC.BAT file), DOS will first search the current directory, then the C:\BATCH sub-directory, then C:\WP, and so on.

```
PATH C:\BATCH;C:\WP;C:\UTILS;C:\DOS
```

Using PATHs allows you to avoid the somewhat cumbersome CD (change directory) commands discussed in a recent Micro-tips article on batch files (*Benchmarks*, Aug/Sep. 1987). Determining whether to use PATHs or BATCH files depends upon the software you want to run. Some applications, such as Procomm, automatically look in the current directory for configuration files that establish default communications settings, a dialing directory, etc. If Procomm does not find these files, it will create them in the current directory. If Procomm was executed from the root directory (C:\) using a PATH to the

Procomm sub-directory, you would end up with several unnecessary (and duplicate) Procomm configuration files in your root directory. For software that doesn't allow you to specify the location of configuration files, it is better to set up a batch file that changes the default directory to the software's sub-directory and then runs the program. Other programs (like Word Perfect, if installed properly) can be instructed where to look for these configuration files even if your current sub-directory is different from the directory where the program's files are located. It is reasonable to use a PATH for these types of programs.

Another consideration is the importance of accessing a program in a remote directory (and concurrently retaining the present default directory) as opposed to the convenience of running a remote program with a simple command (as with a batch file). For example, since my PATH includes the C:\DOS sub-directory, I can print a file in the present (e.g. C:\SPSS) sub-directory using the DOS PRINT command by entering `PRINT filename`. Without the PATH, I would have to "CD" to the C:\DOS sub-directory, and then enter `PRINT \SPSS\filename`. However, if I want to run PCWS to communicate with MUSIC, then there is no particular reason for keeping C:\SPSS as the default sub-directory, so I have a .BAT file (in the C:\BATCH sub-directory) that changes the default to C:\COMM\PCWS and then runs PCWS from there.

In general, PATH commands should be inserted in your AUTOEXEC.BAT file for automatic execution at boot-time. When considering which sub-directories to include and in what order to put them, keep the following general rules in mind:

- 1) DOS has to look through all of the PATHed sub-directories for each command you type. This can slow things down if you mistype a command, so limit the PATH specification to sub-directories containing commonly accessed programs.
- 2) Place frequently accessed sub-directories early in the PATH specification since they will be searched first.
- 3) Place sub-directories with a small number of files early (they are searched quickly).

Also remember that since the PATH command is limited to .COM, .EXE, and .BAT files, it will not search for text files. If you have a need to access text files across directories, you may wish to consider the shareware utility SEARCH.COM. Contact Academic Computing Services (565-2324) for further information.

Multitasking With a PC

Although personal computers running the MS-DOS operating system were designed to perform one task at a time, some users have applications that would benefit from the ability to run two programs simultaneously. For example, if you spend a great deal of time transferring files to and from another computer, it would be useful to be able to do some word processing while you are waiting for the files to be transferred. Another example would be a database user who would like to sort a database file while checking his mail on

the mainframe. The new OS/2 operating system promises to allow users these capabilities; however, it is currently possible to perform these multiple tasks using current versions of MS-DOS, albeit with some sacrifices in performance, using multitasking programs such as Double-DOS and DesqView.

These programs "time-slice" your computer's microprocessor, allowing it to execute more than one program at a time. Actually, the programs aren't really running simultaneously; the microprocessor executes a portion of one and then the other, thus creating the illusion of concurrent execution. As a result, the speed at which either program runs is diminished, but the convenience of running multiple programs may offset the decrease in speed. Both Double-DOS and DesqView are available for less than \$100, so they might be worth the risk if it sounds like multitasking might increase your productivity. Choosing between the two depends upon several considerations. First of all, Double-DOS requires less memory, thus allowing larger programs to run simultaneously (the amount of memory used by DOS, Double-DOS, and your applications cannot exceed 640K). However, DesqView can take advantage of expanded memory boards so that you could theoretically run ten programs, each of which required 512K of memory. In addition, DesqView is generally regarded as the more powerful of the two programs and is capable of taking full advantage of the new 80386 microprocessors.

Although these programs can be quite useful, several caveats are in order at this point. First, as noted above, performance on a typical NTPC will decrease noticeably if you try to run more than one program at a time. An AT-class machine is much more appropriate. Second, in order to use DesqView to run multiple programs with a combined memory in excess of 640K, you must have an ENHANCED expanded memory board, such as those available from AST and Quadram and not the original LIM expanded memory board developed by Lotus, Intel, and Microsoft (Note that the newly announced LIM 4.0 boards do have this capability). If you have further questions about multitasking on PCs, contact Academic Computing Services at 565-2324.

Procomm Outside Environment Utility

Many users of Procomm have discovered that the software can be configured to allow for the execution of a preferred editor by typing ALT-A. This can be useful to users who perform frequent file transfers between systems and need to edit extraneous material. The Procomm Outside Environment program (POE), written by Mark Herring, is a public-domain utility that allows you to run up to 15 different programs from inside ProComm. POE was originally developed to allow Procomm to support additional file transfer protocols such as ZMODEM, but it also allows you to run any DOS application (provided you have sufficient memory) and commonly used shareware DOS utilities such as LIST, WHEREIS, and Quick Filer without having to exit Procomm. POE is invoked by pressing <ALT> <A> from within Procomm. It is menu-driven and extremely easy to use. Parameters can also be passed to utility programs from within POE. If you are interested in getting a copy of POE, contact Academic Computing Services at 565-2324. §

VAXEN

VAXcluster Connected to TEXNET

by Billy Barron VAX Operator (BILLY@NTSUVAX)

NTSU has recently become affiliated with TEXNET, a DECnet-based interactive network of some 30 Texas academic and research institutions. The network, which is managed by the UT Office of Telecommunication Services, includes approximately 500 nodes connected via high-speed dedicated phone lines. Among the educational institutions connected to TEXNET are all UT System institutions, Texas A&M, the University of Houston, Texas Tech, Baylor University, Southwest Texas State University, and Sam Houston State University (A complete list of nodes connected to TEXNET can be found in the VAX SYS\$INFO directory under the file name TEXNET_NODES.DOC). The stated objectives of TEXNET include the following:

- To encourage communication and collaborative research among faculty members at Texas colleges and universities.
- To provide access to a variety of regional computational resources.
- To provide gateway services to external networks such as ARPANET, SPAN, and TELENET.
- To facilitate the sharing of public domain software and to allow for shared software distribution programs.
- To facilitate general purpose data exchange for administrative, accounting, or other institutional business applications.

The major difference between TEXNET and BITNET is that TEXNET is an interactive network, thus allowing users to login to any host computer on the network, providing the user has an account on the host system (the logistics of providing accounts on other host systems have not as yet been worked out, but the UT Office of Telecommunication Services is working on it). All commands that work over DECnet will work over TEXNET, including COPY, DIRECTORY, TYPE, and SET HOST.

The primary capability of TEXNET that users can immediately take advantage of is the electronic mail facility. To send mail to another node on TEXNET, use the syntax `NODE::USERID`. For example, if you need to send a mail message to the userid BOB at TEXNET node UTCHPC, you would type the following:

```
$MAIL < RETURN >
MAIL > SEND UTCHPC::BOB < RETURN >
Subj: How was your weekend < RETURN >
Enter your message below. Press CTRL/Z when complete, or
CTRL/C to quit.
```

Type **HELP TEXNET** from the VAX \$ prompt for further information on TEXNET. If you have further questions, send electronic mail to the VAX OPERATOR account.\$

1987 VAXcluster Software Highlights

The last issue of *Benchmarks* contained an article describing the changes and additions to Computing Center software during the past year. The VAXcluster portion of the article was incomplete. VAX software installations and upgrades in 1987 were as follows:

- DIRPAGE – Created utility to page output from DIR command (January).
- CHANGEMVSPW – Created utility to change MVS batch passwords (February).
- System W – Installed version 2.2.7 (February).
- USERID – Upgraded utility to get userid from real name (Feb.).
- TRANSFER – Upgraded utility to copy files to your MUSIC account (March).
- FORTRAN compiler – Upgraded to version 4.6 (March).
- PRT – Created print menu utility (March)
- BMDP – Upgraded to 1987 version. (April).
- COBOL compiler – Upgraded to version 3.4 (April).
- DTR32 – Upgraded DATATRIEVE database (April).
- Forth interpreter – Installed version 2.0 (April).
- NAMES – Installed utility to show users real names (April).
- Pascal compiler – Upgraded to version 3.5 (April).
- BASIC compiler – Upgraded to version 3.1 (May).
- CLOCK – Installed utility to display a clock on screen (May).
- DECserver – Installed version 1.0 terminal server software (May).
- DIE – Upgraded utility to stop disconnected processes (May).
- JNET – Installed version 3.0 (May).
- PRT Utility – Waterloo/SCRIPT option added (May).
- Kermit – Upgraded to version 3.3 (June).
- Ada compiler – Upgraded to version 1.3 (June).
- NET-MAILER – Installed (June).
- VAX C compiler – Upgraded to version 2.3 (June).
- Diskkeeper – Installed disk compression utility (July).
- Gmail – Upgraded to version 1.21 (July).
- SYSTAT – Upgraded system status utility to version 2.0 (July)
- SimScript – Installed version 4.5.4 (July).
- UNLIST – Installed utility to translate a listing file to a program file (July).
- UNREAD – Installed DECUS utility to check "read status" on mail you sent (August).
- FINGER – Enhanced utility to get real name for userid (Aug.).\$

INFORMATION SYSTEMS

Staffing Changes in Information Systems

By Douglas Heruska, Documentation Specialist

Several staffing changes have occurred during the summer months. Two people have left and we have one newcomer. There was also some rearranging within Information Systems.

Jim Jones has filled the vacant position of Production Analyst. He is currently evaluating Job Scheduling software for possible implementation at NTSU.

Eric Duchemin was hired in July to replace Jim as the Fiscal Team Leader. Eric has an extensive background in data processing and recently left Southwestern Life Insurance.

Eric has been a long time resident of Denton and the NTSU Computing Center will benefit tremendously from his expertise.

Paul Richardson accepted a new position as of the 1st of August at TCOM in Fort Worth. This leaves an opening on the TCOM side of the Fiscal Team. We will still have the opportunity to see Paul on his occasional business visits to the University.

Laura Massey resigned at the end of August from her position on the General Systems Team. She plans to finish her Bachelors degree in Business Administration and possibly continue for her Masters degree. \$

OPERATIONS

NAS/8083 Dual Processor Performance Statistics for August

CPU	SYSTEM	Scheduled Operating Hours	Planned Maintenance Hours	Planned Production Hours	Unplanned Maintenance Hours	Production Hours Achieved	System Uptime
ACAD	VM/SP3	744	0.17	743.83	0.47	743.36	99.9%
ACAD	MUSIC/SP	744	28.44	715.56	3.03	712.53	99.6%
ACAD	MVS/JES2	744	0.17	743.83	1.11	742.72	99.9%
ACAD	COMPLETA	744	0.17	743.83	1.66	742.17	99.8%
ADMN	MVS/JES2	744	0.42	743.58	0.12	743.46	99.9%
ADMN	COMPLETA	299	0.00	299.00	0.82	298.18	99.7%
ADMN	ADABASA	744	24.23	719.77	11.46	708.31	98.4%

Performance statistics continued ...

System Uptime = (Production Hours Achieved) / (Planned Production Hours)

Production Hours Achieved = (Planned Production) - (Unplanned Maintenance)

Scheduled Operating Hours = (Planned Maintenance) + (Planned Production)

MUSIC/SP Planned Maintenance Hours include 19.52 hours for system backup and 8.75 hours for VM/SP3 system backup.

ADABASA'S Planned Maintenance Hours include 23.81 hours for system backup.

The ACAD CPU achieved 100% uptime; the NAS/7360 DASD achieved 100% uptime; the NAS/7380 DASD achieved 100% uptime. The ADMN CPU achieved 100% uptime; the NAS/7360 DASD achieved 100% uptime; the NAS/7380 DASD achieved 100% uptime.

Lost productivity is calculated as the greatest amount of elapsed time that any one of the production systems was unavailable for scheduled operation. Lost productivity hours were contributed to by the following key causes:

ACAD CPU:Miscellaneous

1. Undetermined causes for systems restarts.	1.11 HOURS
2. On-line access to MUSIC inhibited to run single BCIS jobs.	1.98
3. Stopped CPU while deinstalling an IBM 2944 and installing an IBM 3044 channel extender.	0.17
4. VM/SP3 System Tuning/Improvements.	0.55
TOTAL:	3.81 HOURS
GRAND TOTAL FOR ACAD:	3.81 HOURS

ADMN CPU:Miscellaneous

1. MVS/JES2 system tuning/improvements.	0.27 HOURS
2. Stopped CPU while deinstalling an IBM 2944 and installing an IBM 3044 channel extender.	0.42
3. ADABASA system shut down for file maintenance.	11.19
4. COMPLETA system down to process single jobs.	0.82
TOTAL:	12.70 HOURS
GRAND TOTAL:	12.70 HOURS

Disk Backup SchedulesBackup Schedule for OS/MVS

OS/MVS disk packs (academic and administrative) are backed up daily, Tuesday through Saturday, from 4-6:30 a.m., and Sunday from Midnight to 3 a.m. A backup of all the operating systems on the NAS CPU and their contents is done once every two weeks at some low activity period over a weekend.

MUSIC/SP Backup Hours

A message will be sent to all users signed on to MUSIC/SP approximately 10 minutes before backups are begun. It will be in the form ** MUSIC SHUT DOWN AT xxxx AM - SCHEDULED BACKUP **. To find out the backup hours while signed on to MUSIC/SP, enter **HELP HOURS**. The following backup schedule is currently in effect:

Tuesday 3 a.m. (for about 3 hours) Weekly backup

Wednesday - Saturday 4 a.m. (for about 2 hours) Daily backup

Saturday Midnight (for about 2 hours) Daily backup

PHOENIX Backup Schedule

PHOENIX is backed up weekly on Sunday night. The backup begins at midnight and lasts for approximately 30 minutes.

VAX Backup Schedule

Incremental backups of the VAXcluster are performed Monday through Thursday at 6 p.m. Users do not have to log-off, but any files that are open at the time of the backup will NOT be backed up.

Full backups of both systems are done every Friday beginning at 8 a.m. These generally will take all day to complete. Again, users do not have to log-off, but any files that are open will not be backed up.

A "Stand Alone" backup of the system disk is done once every two months. This procedure makes a copy of the system disk that can be used to restore its contents if the disk is completely destroyed. The system will be shut-down for this. Watch the system log-on message for specific times and dates.

NOTE: Requests for restoration of files should be made via MAIL to the username OPERATOR. Your file can only be restored if it existed before the last backup was done. §

TECHNICAL SUPPORT

ACADemic (NAS) Program Hit Parade*

The following programs were used the most frequently on the NAS CPU during the month of August.

AUGUST TOP TEN PROGRAMS : FREQUENCY OF RUNS

Program	Description	Number of Runs	Percent of Total
1.IEWL	Linkage Editor	7951	13.5
2.PGM = *.DD	Compiled Program	7949	13.5
3.IKFCBL00	VS COBOL Compiler	6969	11.9
4.IEBPTPCH	IBM List Utility	6332	10.8
5.IEBGENER	IBM Utility	4516	7.7
6.IDCAMS	VSAM Utility	3825	6.5
7.SASLPA	SAS	3462	5.9
8.SCRIPT	Waterloo/SCRIPT	2895	4.9
9.IEV90	Assembler H	2597	4.4
10.IEFBR14	IBM Null Utility	2222	3.8

AUGUST TOP TEN PROGRAMS: CPU SECONDS USED

Program	Description	CPU Seconds	Percent of Total
1.SASLPA	SAS	45231	36.5
2.PGM = *.DD	Compiled Program	27520	22.2
3.IKFCBL00	VS COBOL Compiler	10131	8.2
4.SCRIPT	Waterloo/SCRIPT	9008	7.3
5.SPSSX	SPSSX	6054	4.9
6.IDCAMS	VSAM Utility	3224	2.6
7.IEBPTPCH	IBM List Utility	2115	1.7
8.RESOLVE	System programming tool	2064	1.7
9.IEWL	Linkage Editor	1765	1.4
10.PTPCH	Dataset Lister	1589	1.3

* ACAD is the official designation of the part of the NAS/8083 CPU that is dedicated to faculty and student use. The portion of the computer reserved for University administrative purposes is termed ADMN. §

Benchmarks Reader/User feedback is encouraged. Send all letters, suggestions to:

North Texas State University
The Computing Center
NT Station, Box 13495
Denton, Texas 76203
Attn: *Benchmarks* Editor

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Manager of Information Systems

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Manager of Technical Support

Registration Form for Computing Center Short Courses

Please complete this form and return it AS SOON AS POSSIBLE if you wish to attend any of the short courses listed below. You may also register over the phone by calling 565-2324.

NAME: _____ PHONE: _____

DEPT: _____ CLASSIFICATION: _____

I wish to attend:

● **Introduction to MUSIC/SP, Part I (ISB 110):**

___ Monday, October 19: 9-11 a.m.

___ Tuesday, October 20: 3-5 p.m.

___ Wednesday, October 21: 1-3 p.m.

● **Introduction to MUSIC/SP, Part II (ISB 110):**

___ Tuesday, October 27: 6-8 p.m.

● **Introduction to IBM JCL (Graphics Lab, ISB):**

___ Wednesday, October 21: 1-3 p.m.

● **Introduction to SAS (ISB 110):**

___ Thursday, October 22: 6-8 p.m.

● **Introduction to SPSS-X (ISB 110):**

___ Monday, October 26: 6-8 p.m.

● **File Handling With SAS, SPSS^X & BMDP (Graphics Lab, ISB):**

___ Friday, October 30: 1-3 p.m.

● **Introduction to SAS/GRAPH (Graphics Lab, ISB):**

___ Tuesday, October 27: 3-5 p.m.

● **Introduction to CMS (Graphics Lab, ISB):**

___ Monday, October 26: 3-5 p.m.

● **Introduction to VAX/VMS, Part I (ISB 110):**

___ Thursday, October 22: 2-5 p.m.

● **Introduction to VAX/VMS, Part II (ISB 110):**

___ Wednesday, October 28: 1-3 p.m.

● **Introduction to BitNet (ISB 110):**

___ Wednesday, October 28: 3-5 p.m.

● **I would like to see more classes offered:** ___ on weekends; ___ at night.

The classes I am interested in are: _____

**Academic Computing Services
The Computing Center
NT Box 13495
North Texas State University
Denton, TX 76203**

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